

WO 2004/018681

PCT/EP2003/008701

10/522883

SEQUENCE LISTING

<110> CYTHERIS

<120> IL-7 drug substance, composition, preparation and uses.

<130> B0131WO

<140>

<141>

<160> 23

<170> PatentIn Ver. 2.1

<210> 1

<211> 459

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: r-hIL-7 cDNA

<220>

<221> CDS

<222> (1)..(459)

<400> 1

atg	gat	tgt	gat	att	gaa	ggt	aaa	gat	ggc	aaa	caa	tac	gag	tcc	ggt	48
Met	Asp	Cys	Asp	Ile	Glu	Gly	Lys	Asp	Gly	Lys	Gln	Tyr	Glu	Ser	Val	
1				5					10					15		

ctg	atg	gtc	agc	atc	gat	caa	tta	ttg	gac	agc	atg	aaa	gaa	att	ggt	96
Leu	Met	Val	Ser	Ile	Asp	Gln	Leu	Leu	Asp	Ser	Met	Lys	Glu	Ile	Gly	
			20					25					30			

agc	aat	tgc	ctg	aat	aat	gaa	ttt	aac	ttt	ttt	aaa	aga	cat	atc	tgt	144
Ser	Asn	Cys	Leu	Asn	Asn	Glu	Phe	Asn	Phe	Phe	Lys	Arg	His	Ile	Cys	
		35					40					45				

gat	gct	aat	aag	gaa	ggt	atg	ttt	tta	ttc	cgt	gct	gct	cgc	aag	ttg	192
Asp	Ala	Asn	Lys	Glu	Gly	Met	Phe	Leu	Phe	Arg	Ala	Ala	Arg	Lys	Leu	
	50					55					60					

agg	caa	ttt	ctt	aaa	atg	aat	agc	act	ggt	gat	ttt	gat	ctc	cac	tta	240
Arg	Gln	Phe	Leu	Lys	Met	Asn	Ser	Thr	Gly	Asp	Phe	Asp	Leu	His	Leu	
65					70					75					80	

tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac tgc act ggc cag 288
 Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln
 85 90 95

gtt aaa gga aga aaa cca gct gcc ctg ggt gaa gcc caa cca aca aag 336
 Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys
 100 105 110

agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa aaa ctg aat gac 384
 Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp
 115 120 125

ttg tgt ttc cta aag aga cta tta caa gag ata aaa act tgt tgg aat 432
 Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn
 130 135 140

aaa att ttg atg ggc act aaa gaa cac 459
 Lys Ile Leu Met Gly Thr Lys Glu His
 145 150

<210> 2

<211> 153

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: r-hIL-7 cDNA

<400> 2

Met Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val
 1 5 10 15

Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met Lys Glu Ile Gly
 20 25 30

Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys Arg His Ile Cys
 35 40 45

Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala Ala Arg Lys Leu
 50 55 60

Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe Asp Leu His Leu
 65 70 75 80

Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln
 85 90 95

Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys
 100 105 110

Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp
 115 120 125

Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn
 130 135 140

Lys Ile Leu Met Gly Thr Lys Glu His
 145 150

<210> 3

<211> 531

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: r-hIL-7 cDNA

<220>

<221> CDS

<222> (1)..(531)

<400> 3

atg ttc cat gtt tct ttt agg tat atc ttt gga ctt cct ccc ctg atc 48
 Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
 1 5 10 15

ctt gtt ctg ttg cca gta gca tca tct gat tgt gat att gaa ggt aaa 96
 Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys
 20 25 30

gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat caa tta 144
 Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
 35 40 45

ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt 192
 Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
 50 55 60

aac ttt ttt aaa aga cat atc tgt gat gct aat aag gaa ggt atg ttt 240
 Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
 65 70 75 80

tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg aat agc 288
 Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
 85 90 95

act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc aca aca 336
 Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr
 100 105 110

 ata ctg ttg aac tgc act ggc cag gtt aaa gga aga aaa cca gct gcc 384
 Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
 115 120 125

 ctg ggt gaa gcc caa cca aca aag agt ttg gaa gaa aat aaa tct tta 432
 Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
 130 135 140

 aag gaa cag aaa aaa ctg aat gac ttg tgt ttc cta aag aga cta tta 480
 Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
 145 150 155 160

 caa gag ata aaa act tgt tgg aat aaa att ttg atg ggc act aaa gaa 528
 Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
 165 170 175

 cac 531
 His

<210> 4

<211> 177

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: r-hIL-7 cDNA

<400> 4

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
 1 5 10 15

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys
 20 25 30

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
 35 40 45

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
 50 55 60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
 65 70 75 80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser

	85		90		95
Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr					
	100		105		110
Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala					
	115		120		125
Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu					
	130		135		140
Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu					
	145		150		155
					160
Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu					
	165		170		175

His

<210> 5
 <211> 37
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 5
 attccatattg gattgtgata ttgaaggtaa agatggc

37

<210> 6
 <211> 36
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: Primer

<400> 6
 agccggatcc ttatcagtgt tcttttagtgc ccatca

36

<210> 7
 <211> 64

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Primer

<400> 7

tagggaattc catatggatt gtgatattga aggtaaagat ggcaaacaat acgagtcggt 60
tctg 64

<210> 8

<211> 48

<212> DNA

<213> Artificial Sequence

<400> 8

gcaagcttgc caccatgttc catgtttcct ttaggtatat ctttggac 48

<210> 9

<211> 36

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: ptac1 primer

<400> 9

atcgagatct aattctcatg ttgacagct tatcat 36

<210> 10

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: ptac2 primer

<400> 10

atcgtctaga gctgtttcct gtgtgaaatt gttatccg 38

<210> 11

<211> 20

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: tac promoter
primer

<400> 11

ttcgtgtcgc tcaaggcgca

20

<210> 12

<211> 531

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PS-sIL-7 cDNA

<220>

<221> CDS

<222> (1)..(531)

<400> 12

atg ttc cat gtt tct ttt agg tat atc ttt gga ctt cct ccc ctg atc 48

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile

1

5

10

15

ctt gtt ctg ttg cca gta gca tca tct gat tgt gat att gaa ggt aaa 96

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys

20

25

30

gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat caa tta 144

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu

35

40

45

ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt 192

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe

50

55

60

aac ttt ttt aaa aga cat cta tgt gat gat aat aag gaa ggt atg ttt 240

Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe

65

70

75

80

tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg aat agc 288

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser

85

90

95

act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc aca aca 336

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr

100	105	110	
ata ctg ttg aac tgc acc ggc aag gtt aaa gga aga aaa cca gct gcc			384
Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala			
115	120	125	
ctg ggt gaa ccc caa cca aca aag agt ttg gaa gaa aat aaa tct tta			432
Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu			
130	135	140	
aag gaa cag aaa aaa ctg aat gac tca tgt ttc cta aag aga cta cta			480
Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu			
145	150	155	160
caa aag ata aaa act tgt tgg aat aaa att ttg atg ggc act aaa gaa			528
Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu			
	165	170	175
cac			531
His			

<210> 13

<211> 177

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: PS-sIL-7 cDNA

<400> 13

Met	Phe	His	Val	Ser	Phe	Arg	Tyr	Ile	Phe	Gly	Leu	Pro	Pro	Leu	Ile
1				5					10					15	

Leu	Val	Leu	Leu	Pro	Val	Ala	Ser	Ser	Asp	Cys	Asp	Ile	Glu	Gly	Lys
		20						25					30		

Asp	Gly	Lys	Gln	Tyr	Glu	Ser	Val	Leu	Met	Val	Ser	Ile	Asp	Gln	Leu
	35						40					45			

Leu	Asp	Ser	Met	Lys	Glu	Ile	Gly	Ser	Asn	Cys	Leu	Asn	Asn	Glu	Phe
	50					55					60				

Asn	Phe	Phe	Lys	Arg	His	Leu	Cys	Asp	Asp	Asn	Lys	Glu	Gly	Met	Phe
65					70					75				80	

Leu	Phe	Arg	Ala	Ala	Arg	Lys	Leu	Arg	Gln	Phe	Leu	Lys	Met	Asn	Ser
			85					90					95		

Thr	Gly	Asp	Phe	Asp	Leu	His	Leu	Leu	Lys	Val	Ser	Glu	Gly	Thr	Thr
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

	100		105		110										
Ile	Leu	Leu	Asn	Cys	Thr	Gly	Lys	Val	Lys	Gly	Arg	Lys	Pro	Ala	Ala
	115						120					125			
Leu	Gly	Glu	Pro	Gln	Pro	Thr	Lys	Ser	Leu	Glu	Glu	Asn	Lys	Ser	Leu
	130						135					140			
Lys	Glu	Gln	Lys	Lys	Leu	Asn	Asp	Ser	Cys	Phe	Leu	Lys	Arg	Leu	Leu
145					150					155					160
Gln	Lys	Ile	Lys	Thr	Cys	Trp	Asn	Lys	Ile	Leu	Met	Gly	Thr	Lys	Glu
				165					170					175	

His

<210> 14

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BclXL5'Not1
primer

<400> 14

tagcgggccgc atgtctcaga gcaaccgg

28

<210> 15

<211> 28

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: BclXL3'BstBI
primer

<400> 15

acttcgaatc atttccgact gaagagtg

28

<210> 16

<211> 537

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: EPOPS-r-hIL-7
cDNA

<220>

<221> CDS

<222> (1)..(537)

<400> 16

atg ggg gtg cac gaa tgt cct gcc tgg ctg tgg ctt ctc ctg tcc ctg	48
Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu	
1 5 10 15	
ctg tcg ctc cct ctg ggc ctc cca gtc ctg ggc gat tgt gat att gaa	96
Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu	
20 25 30	
ggt aaa gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat	144
Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp	
35 40 45	
caa tta ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat	192
Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn	
50 55 60	
gaa ttt aac ttt ttt aaa aga cat atc tgt gat gct aat aag gaa ggt	240
Glu Phe Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly	
65 70 75 80	
atg ttt tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg	288
Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met	
85 90 95	
aat agc act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc	336
Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly	
100 105 110	
aca aca ata ctg ttg aac tgc act ggc cag gtt aaa gga aga aaa cca	384
Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro	
115 120 125	
gct gcc ctg ggt gaa gcc caa cca aca aag agt ttg gaa gaa aat aaa	432
Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys	
130 135 140	
tct tta aag gaa cag aaa aaa ctg aat gac ttg tgt ttc cta aag aga	480

Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg
 145 150 155 160

cta tta caa gag ata aaa act tgt tgg aat aaa att ttg atg ggc act 528
 Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr
 165 170 175

aaa gaa cac 537
 Lys Glu His

<210> 17

<211> 179

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: EPOPS-r-hIL-7
 cDNA

<400> 17

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu
 20 25 30

Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp
 35 40 45

Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn
 50 55 60

Glu Phe Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly
 65 70 75 80

Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met
 85 90 95

Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly
 100 105 110

Thr Thr Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro
 115 120 125

Ala Ala Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys
 130 135 140

Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg
 145 150 155 160

Leu Leu Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr
 165 170 175

Lys Glu His

<210> 18

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:

HMM38PS-r-hIL-7 cDNA

<220>

<221> CDS

<222> (1)..(519)

<400> 18

atg tgg tgg cgc ctg tgg tgg ctg ctg ctg ctg ctg ctg ctg tgg 48
 Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Leu Trp
 1 5 10 15

ccc atg gtg tgg gcc gat tgt gat att gaa ggt aaa gat ggc aaa caa 96
 Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln
 20 25 30

tac gag tcc gtt ctg atg gtc agc atc gat caa tta ttg gac agc atg 144
 Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met
 35 40 45

aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt aac ttt ttt aaa 192
 Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys
 50 55 60

aga cat atc tgt gat gct aat aag gaa ggt atg ttt tta ttc cgt gct 240
 Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala
 65 70 75 80

gct cgc aag ttg agg caa ttt ctt aaa atg aat agc act ggt gat ttt 288
 Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe
 85 90 95

gat ctc cac tta tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac 336

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn
 100 105 110

 tgc act ggc cag gtt aaa gga aga aaa cca gct gcc ctg ggt gaa gcc 384
 Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala
 115 120 125

 caa cca aca aag agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa 432
 Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys
 130 135 140

 aaa ctg aat gac ttg tgt ttc cta aag aga cta tta caa gag ata aaa 480
 Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys
 145 150 155 160

 act tgt tgg aat aaa att ttg atg ggc act aaa gaa cac 519
 Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His
 165 170

<210> 19

<211> 173

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence:

HMM38PS-r-hIL-7 cDNA

<400> 19

Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Leu Trp
 1 5 10 15

Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln
 20 25 30

Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met
 35 40 45

Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys
 50 55 60

Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe Leu Phe Arg Ala
 65 70 75 80

Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe
 85 90 95

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn
 100 105 110

Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Ala
 115 120 125

Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys
 130 135 140

Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu Gln Glu Ile Lys
 145 150 155 160

Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His
 165 170

<210> 20

<211> 537

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: EPOPS-sIL-7
 cDNA

<220>

<221> CDS

<222> (1)..(537)

<400> 20

atg ggg gtg cac gaa tgt cct gcc tgg ctg tgg ctt ctc ctg tcc ctg 48
 Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15

ctg tcg ctc cct ctg ggc ctc cca gtc ctg ggc gat tgt gat att gaa 96
 Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu
 20 25 30

ggt aaa gat ggc aaa caa tac gag tcc gtt ctg atg gtc agc atc gat 144
 Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp
 35 40 45

caa tta ttg gac agc atg aaa gaa att ggt agc aat tgc ctg aat aat 192
 Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn
 50 55 60

gaa ttt aac ttt ttt aaa aga cat cta tgt gat gat aat aag gaa ggt 240
 Glu Phe Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly
 65 70 75 80

atg ttt tta ttc cgt gct gct cgc aag ttg agg caa ttt ctt aaa atg 288
 Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met
 85 90 95

aat agc act ggt gat ttt gat ctc cac tta tta aaa gtt tca gaa ggc 336
 Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly
 100 105 110

aca aca ata ctg ttg aac tgc acc ggc aag gtt aaa gga aga aaa cca 384
 Thr Thr Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro
 115 120 125

gct gcc ctg ggt gaa ccc caa cca aca aag agt ttg gaa gaa aat aaa 432
 Ala Ala Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys
 130 135 140

tct tta aag gaa cag aaa aaa ctg aat gac tca tgt ttc cta aag aga 480
 Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg
 145 150 155 160

cta cta caa aag ata aaa act tgt tgg aat aaa att ttg atg ggc act 528
 Leu Leu Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr
 165 170 175

aaa gaa cac 537
 Lys Glu His

<210> 21

<211> 179

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: EPOPS-sIL-7
 cDNA

<400> 21

Met Gly Val His Glu Cys Pro Ala Trp Leu Trp Leu Leu Leu Ser Leu
 1 5 10 15

Leu Ser Leu Pro Leu Gly Leu Pro Val Leu Gly Asp Cys Asp Ile Glu
 20 25 30

Gly Lys Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp
 35 40 45

Gln Leu Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn
 50 55 60

Glu Phe Asn Phe Phe Lys Arg His Leu Cys Asp Asp Asn Lys Glu Gly
 65 70 75 80
 Met Phe Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met
 85 90 95
 Asn Ser Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly
 100 105 110
 Thr Thr Ile Leu Leu Asn Cys Thr Gly Lys Val Lys Gly Arg Lys Pro
 115 120 125
 Ala Ala Leu Gly Glu Pro Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys
 130 135 140
 Ser Leu Lys Glu Gln Lys Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg
 145 150 155 160
 Leu Leu Gln Lys Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr
 165 170 175
 Lys Glu His

<210> 22

<211> 519

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HMM38PS-sIL-7
 cDNA

<220>

<221> CDS

<222> (1)..(519)

<400> 22

atg tgg tgg cgc ctg tgg tgg ctg ctg ctg ctg ctg ctg ctg tgg 48
 Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Leu Trp
 1 5 10 15
 ccc atg gtg tgg gcc gat tgt gat att gaa ggt aaa gat ggc aaa caa 96
 Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln
 20 25 30


```

tac gag tcc gtt ctg atg gtc agc atc gat caa tta ttg gac agc atg 144
Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met
      35              40              45

aaa gaa att ggt agc aat tgc ctg aat aat gaa ttt aac ttt ttt aaa 192
Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys
      50              55              60

aga cat cta tgt gat gat aat aag gaa ggt atg ttt tta ttc cgt gct 240
Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe Leu Phe Arg Ala
      65              70              75              80

gct cgc aag ttg agg caa ttt ctt aaa atg aat agc act ggt gat ttt 288
Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe
      85              90              95

gat ctc cac tta tta aaa gtt tca gaa ggc aca aca ata ctg ttg aac 336
Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn
      100              105              110

tgc acc ggc aag gtt aaa gga aga aaa cca gct gcc ctg ggt gaa ccc 384
Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Pro
      115              120              125

caa cca aca aag agt ttg gaa gaa aat aaa tct tta aag gaa cag aaa 432
Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys
      130              135              140

aaa ctg aat gac tca tgt ttc cta aag aga cta cta caa aag ata aaa 480
Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu Gln Lys Ile Lys
      145              150              155              160

act tgt tgg aat aaa att ttg atg ggc act aaa gaa cac 519
Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His
      165              170

```

<210> 23

<211> 173

<212> PRT

<213> Artificial Sequence

<223> Description of Artificial Sequence: HMM38PS-sIL-7
cDNA

<400> 23

```

Met Trp Trp Arg Leu Trp Trp Leu Leu Leu Leu Leu Leu Trp
  1              5              10              15

```

Pro Met Val Trp Ala Asp Cys Asp Ile Glu Gly Lys Asp Gly Lys Gln
 20 25 30

Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu Leu Asp Ser Met
 35 40 45

Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe Asn Phe Phe Lys
 50 55 60

Arg His Leu Cys Asp Asp Asn Lys Glu Gly Met Phe Leu Phe Arg Ala
 65 70 75 80

Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser Thr Gly Asp Phe
 85 90 95

Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr Ile Leu Leu Asn
 100 105 110

Cys Thr Gly Lys Val Lys Gly Arg Lys Pro Ala Ala Leu Gly Glu Pro
 115 120 125

Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu Lys Glu Gln Lys
 130 135 140

Lys Leu Asn Asp Ser Cys Phe Leu Lys Arg Leu Leu Gln Lys Ile Lys
 145 150 155 160

Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu His
 165 170